

APPENDIXES

APPENDIX I. DETAILED LONG-RANGE COST ESTIMATES

The estimates presented in the previous report of the Board of Trustees related to the program as it was after the 1954 amendments. Since the date of the last report, the 1956 amendments have been enacted and the earnings assumptions have been revised to reflect approximately the 1955 experience. Thus the differences in the assumptions underlying the cost estimates in last year's report and this one are in respect to the provisions of the act and in respect to covered earnings.

The estimates are based on level earnings assumptions. If earnings levels in the future should be considerably above that which now prevails, and if at the same time the benefits for those on the roll are adjusted upward so that annual costs in relation to payroll remain the same, then the resulting increased dollar outgo will offset the increased dollar income. This is an important reason for considering costs relative to payroll rather than in dollars.

The cost estimates have not taken into account the possibility of a rise in earnings levels, although such rises have characterized the past history of this country. If such an assumption were used in the cost estimates and if the benefit formula nevertheless were not changed, the cost relative to payroll would, of course, be lower. If benefits are adjusted continuously and without any time-lag to keep pace with rising earnings trends, the year-by-year costs as a percentage of payroll would be unaffected. Such an adjustment, however, would raise the level-premium cost, since under these circumstances the relative value of the interest earnings on the trust fund would diminish with the passage of time.

A useful concept of long-range cost is the level-premium contribution rate required to support the system in perpetuity. This is obtained by discounting future benefits and assumed contributions at compound interest and assuming that benefit payments and taxable payrolls remain level after the year 2050 (actually the relationship between benefits and payroll is assumed virtually constant after about 2020). If such a level rate were adopted, relatively large accumulations in the trust fund would result, and in consequence there would also be sizeable eventual income from interest. Even though such a method of financing is not followed, this concept provides a useful measure of long-range costs which takes into account the heavy deferred load.

There are a number of basic factors, both demographic and economic, which must be continually reexamined in estimating the cost of this program. As a result of this continual reexamination, there is now in process a complete revision of the long-range cost estimates. It is expected that this revision will result in a slight increase in the

estimated cost of the program for the immediate future. This is due in part to the fact that population assumptions have been in need of change and also because the participation in the system in recent years has been somewhat more extensive than had been previously estimated. It is not yet possible to state what the effect will be on overall long-range costs. Upon the completion of these revisions there will be available a more up-to-date analysis of the long-range costs of the old-age, survivors, and disability insurance program.

(a) *Population growth.*—The future trend of the population depends on the size and age distribution of the existing population, on future births and immigration, and on future deaths and emigration. In making use of the extensive census and vital statistics data available, one must be aware of the various types of error and bias (fully recognized and analyzed in their publications by the Bureau of the Census and the National Office of Vital Statistics) which are present.

Crude birth rates declined for many years until about 1935, due in part to the increasing proportion of the female population past the childbearing ages, and in part to a decline in age-specific birth rates. However, since 1937 the long decline of the birth rate has been reversed. During the war years, high birth rates were reported, the wartime peak being reached in 1943. Although there was some decline in 1944-45, the birth rate remained higher than at any time during the thirties, despite the fact that the war removed many potential fathers from the country. Beginning in 1946, a very rapid rise occurred, and the birth rate for the 12-month period ending June 1947 was higher than at any time since the beginning of World War I. The peak was followed by some decline and a subsequent rise in 1951-55, which did not quite reach the 1947 level.

Net immigration had been very heavy prior to 1915 and moderate in the early twenties, but was quite negligible thereafter. Most population forecasts have assumed that no return to high net immigration rates may be expected.

As a basis for the cost estimates, two population projections have been developed. These do not reflect the maximum possible range in population which might develop in the future, but rather embody combinations of factors which produce either low costs or high costs in regard to old-age and survivors insurance; for example, unfavorable mortality assumptions versus favorable ones. These population projections are presented in detail in Actuarial Study No. 33 of the Social Security Administration (Illustrative United States Population Projections, 1952).

Table 15 indicates the alternative trends of population growth resulting for the total population, for the population aged 20-64, and for the population aged 65 and over. The high-cost projection shows a larger aged population than the low-cost projection because of the assumed lower mortality, but a somewhat smaller population in age groups under 65 because of the assumed lower fertility, which more than offsets the lower mortality.

TABLE 15.—Actual and estimated population of the United States,¹ 1920–2000

[In millions]

Calendar year	All ages			Aged 20 to 64			Aged 65 and over		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Actual data									
1920 (April).....	108	55	53	58	30	28	5.0	2.5	2.5
1930 (April).....	125	64	62	69	35	34	6.7	3.4	3.3
1940 (April).....	135	68	67	79	39	39	9.0	4.4	4.6
1950 (April).....	155	77	78	89	44	45	12.3	5.8	6.5
1956 (July).....	172	83	87	93	46	47	14.6	6.7	7.8
Projection for low-cost assumptions									
1965.....	181	90	91	99	49	50	16.9	7.6	9.3
1980.....	209	103	106	117	58	59	22.0	9.4	12.6
2000.....	248	123	125	139	70	69	25.8	11.0	14.8
Projection for high-cost assumptions									
1965.....	178	88	90	99	49	50	17.1	7.7	9.4
1980.....	197	97	100	116	58	58	22.8	9.9	12.9
2000.....	216	108	108	128	64	64	28.0	12.2	15.8

¹ Includes—in addition to the continental United States—Alaska, Canal Zone, Hawaii, Puerto Rico, and Virgin Islands, and for 1950 and after, Armed Forces and Government employees overseas and their families. For 1940 and later, data for ages 55 to 69 adjusted for age biases in nonwhite population as enumerated.

(b) *Mortality.*—Mortality rates by age have been decreasing steadily since the turn of the century for both sexes and for virtually all ages up to age 60. Although there was relatively little change above that age during the first four decades, significant improvement has occurred during the past decade and a half.

In both the low-cost and high-cost assumptions, continued improvement in mortality rates at all ages is postulated. However, the degree of improvement embodied in the high-cost assumptions is substantially greater. While both sets of assumptions are necessarily arbitrary, they may reasonably be taken as delineating, for the purposes of this report, the range within which mortality rates will fall. If this range seems wide, it should be noted that no allowance has been made for the effects of such diverse factors as reduction in mortality through the application of new discoveries to the prevention of disease and to the impairments caused by disease and, on the other hand, the possibility that mortality rates at older ages might actually increase because more persons with serious impairments, such as diabetes, are enabled to survive to older ages.

(c) *Amount of covered employment.*—In estimating the number of covered persons, percentages of men and women in each age group who are in covered employment are developed through analysis of past wage data for the groups already covered, along with such data relating to the newly covered groups as can be obtained from censuses and other sources. The level of employment assumed is slightly below that currently prevailing.

It is assumed that about 95 percent of all males in the country aged 25–34 have covered earnings in the course of a year, the ratio decreasing to about 75 percent for ages 60–64. For women the corresponding pro-

portions are 45 percent for ages 25-34 and 25 percent for ages 60-64. Further, about 85 percent of covered men are assumed to work in all 4 quarters, with somewhat lower proportions at the youngest and oldest ages. For women, the proportions used were about 55 percent for ages 20-35 and about 65 percent for ages 40 and over. It is assumed that in the future the proportion of women who will be in covered employment will gradually rise for each age group, since in recent years they have been participating more and more in covered employment.

(d) *Proportion of time in covered employment prior to qualification for benefits.*—The number of persons who gain protection through becoming either “fully insured” or “currently insured” under old-age and survivors insurance depends upon the volume and pattern of their work in covered employment and upon the amount of taxable earnings from such work. A discussion of the latter factor is presented subsequently in item (i).

Table 16 shows, at certain future dates, the estimated percentages of the population insured by reason of current or previous work experience, subdivided by sex and by age groups above and below 65. The percentages for age 65 and over include old-age beneficiaries (i. e., retired workers). Table 17 relates the old-age beneficiaries, and the total beneficiaries aged 65 and over actually drawing benefits, to the total aged population.

TABLE 16.—*Estimated proportion of the population insured¹ under old-age and survivors' insurance, 1965-2000*

[In percent]

Calendar year	Low-cost estimate		High-cost estimate	
	Ages 20 to 64	Ages 65 and over	Ages 20 to 64	Ages 65 and over
Men				
1965.....	85	74	89	79
1980.....	88	87	92	91
2000.....	88	92	93	96
Women ²				
1965.....	48	27	53	30
1980.....	52	40	58	46
2000.....	53	50	59	60

¹ Including old-age beneficiaries.

² Excludes wives and widows of fully insured men except such wives and widows who are insured on the basis of their own employment.

NOTE.—The figures in this table are based on high-employment assumptions.

TABLE 17.—*Estimated proportion of population aged 65 and over receiving old-age and survivors insurance benefits, 1965-2000*

[In percent]

Calendar year	Men receiving benefits ¹	Women receiving benefits		
		Old-age benefits ²	Other benefits ³	Total
Low-cost estimate				
1965.....	55	22	35	57
1980.....	68	34	38	72
2000.....	76	45	37	82
High-cost estimate				
1965.....	65	27	37	64
1980.....	76	42	38	80
2000.....	85	56	34	90

¹ Consists almost entirely of old-age beneficiaries (retired insured workers).² Old-age beneficiaries are retired insured workers. Women qualified both for old-age and wife's, widow's, or parent's benefits are considered as old-age beneficiaries.³ Wives of old-age beneficiaries, and widows and dependent mothers of deceased insured workers, excluding women qualifying as old-age beneficiaries.

NOTE.—The figures in this table are based on high-employment assumptions.

(e) *Marital status and family composition.*—Marital relationships by age have great significance for old-age and survivors insurance costs because the system provides benefits for aged wives and widows (and also for aged dependent husbands and widowers). A woman 62 or over cannot draw both the old-age benefit based on her own earnings and a full wife's, widow's, or parent's benefit based on her husband's or child's earnings. Hence, it is necessary to consider both the marital status of the female covered workers and also the exits from this group because of marriage. A relatively large cost offset occurs on account of the provision which prohibits duplication of benefits. The experience to date is still extremely limited in this respect (in December 1955 about 108,500 such dual beneficiaries had smaller old-age benefits, and an unknown number had larger old-age benefits and thus did not receive the supplementary or survivor benefit). This factor will not reach its full magnitude until some 30 or 40 years hence when current female workers in their twenties and thirties have attained the minimum retirement age.

Family composition data, indicating the proportion of individuals with children and the average number of children per family, also have great significance, because the system provides benefits for orphaned children and their widowed mothers. The future birth rate has an important role in this connection since it determines not only the total number of children, but also how they are divided up into families. The actual claims experience, too, is valuable as a guide.

There must also be considered the factors resulting in termination of married status, divorce, and mortality. The distribution of ages of husbands and wives also affects the cost estimates. Various studies have indicated that at almost all ages women have lower mortality rates than men and that the mortality rates of married persons are lower than those for all persons combined. In the cost

estimates differential mortality by marital status has been considered in determining costs for the various types of benefits.

Aged beneficiaries and their dependents are composed of a number of different categories. Table 18 shows the projected trends in the number of beneficiaries, distinguishing between old-age beneficiaries (retired workers), wives and dependent husbands of old-age beneficiaries, children of old-age beneficiaries, aged widows and dependent widowers of deceased insured individuals, and dependent parents of deceased insured workers who left no widows or eligible children. It has been assumed that all retired persons eligible to receive old-age benefits based on their own earnings would apply for and receive these benefits even though they might be entitled to larger wife's, husband's, widow's, widower's or parent's benefits (which instead would be paid as reduced supplementary amounts). This assumption is made because it is rarely to the individual's disadvantage, and may be to his advantage, to receive old-age benefits and reduced supplementary benefits of another category, rather than to receive solely the full benefits of the supplementary category.

TABLE 18.—*Estimated monthly aged beneficiaries,¹ males aged 65 and over, females aged 62 and over, and children of old-age beneficiaries, in current-payment status, 1965-2000*

[In thousands]

Calendar year	Old-age beneficiaries ²	Wives of old-age beneficiaries ³	Children of old-age beneficiaries	Aged widows ⁴	Dependent parents
Actual data for December					
1950.....	1,771	508	46	314	15
1951.....	2,278	647	68	384	19
1952.....	2,644	738	75	455	21
1953.....	3,222	888	90	541	24
1954.....	3,775	1,016	107	638	25
1955.....	4,474	1,192	122	701	25
1956.....	5,112	1,434	131	913	27
Low-cost estimate					
1965.....	6,891	1,569	111	2,351	29
1980.....	11,604	2,015	178	3,763	36
2000.....	15,854	2,224	198	4,252	44
High-cost estimate					
1965.....	8,149	1,816	134	2,412	36
1980.....	13,799	2,189	183	3,809	48
2000.....	20,205	2,374	190	4,019	64

¹ For future estimates, persons qualifying both for old-age benefits and for wife's, widow's, husband's, widower's, or parent's benefits are shown as old-age beneficiaries. For actual data before 1955, such dual beneficiaries are shown under both categories (as of December 1954, about 77,000 such individuals). For actual data after 1954, old-age beneficiaries and wife and husband beneficiaries only are shown under both categories (as of December 1955, about 48,000 such beneficiaries).

² I. e., retired insured workers.

³ Including dependent husbands and also a small number of wives, irrespective of age, with child beneficiaries in their care.

⁴ Including dependent widowers.

NOTE: The estimated figures in this table are based on high-employment assumptions.

Although aged persons make up the bulk of the prospective beneficiaries under the program, the young survivors, composed of orphaned children and widowed mothers, will receive a considerable amount of benefits. Table 19 lists these two groups separately.

34 OLD-AGE AND SURVIVORS INSURANCE AND TRUST FUNDS

TABLE 19.—*Estimated younger survivor monthly beneficiaries in current payment status, 1965-2000*

[In thousands]

Calendar year	Orphaned children	Widowed mothers
Actual data for December		
1960.....	653	169
1951.....	778	204
1952.....	864	229
1953.....	963	254
1954.....	1, 054	272
1955.....	1, 154	292
1956.....	1, 210	301
Low-cost estimate		
1965.....	1, 470	464
1980.....	1, 598	514
2000.....	1, 831	580
High-cost estimate		
1965.....	1, 501	562
1980.....	1, 478	578
2000.....	1, 380	551

NOTE.—The estimated figures in this table are based on high-employment assumptions.

The high-cost assumptions show, as expected, a larger number of old-age beneficiaries, and dependents thereof, than the low-cost assumptions (table 18). This is in part because of the assumed lower mortality rates which result in a greater number and proportion of aged persons, and in part because of the higher retirement rates assumed and the greater proportion of the population assumed to be insured as a result of the in-and-out movement between covered employment and noncovered employment or nonemployment. On the other hand, the lower mortality tends to have the opposite effect in regard to widows (table 17) and, despite the somewhat higher birth rates, in regard to young survivors (table 18); thus a smaller number of survivor beneficiaries is indicated under the high-cost assumptions than under the low-cost assumptions.

Table 20 summarizes the previous discussion by showing illustrative numbers of aged and survivor beneficiaries as well as monthly disability beneficiaries and lump-sum death payments. Widows, widowers, and parents who are at or beyond the minimum retirement age (65 for men and 62 for women) are included under the aged category, as are also spouses and dependent children of old-age beneficiaries.

TABLE 20.—Estimated old-age, survivors, and disability insurance beneficiaries in current-payment status, 1965-2000

[In thousands]

Calendar year	Aged beneficiaries ¹	Younger survivors	Monthly disability ²	Lump-sum death payments ³
Actual data for December				
1950.....	2,654	823	-----	200
1951.....	3,397	982	-----	414
1952.....	3,933	1,093	-----	438
1953.....	4,784	1,217	-----	512
1954.....	5,561	1,326	-----	516
1955.....	6,515	1,446	-----	567
1956.....	7,617	1,511	-----	547
Low-cost estimate ⁴				
1965.....	10,951	1,934	477	936
1980.....	17,596	2,112	703	1,328
2000.....	22,572	2,411	813	1,743
High-cost estimate ⁴				
1965.....	12,547	2,063	1,026	967
1980.....	20,028	2,056	1,438	1,361
2000.....	26,852	1,931	1,683	1,795

¹ Including children of old-age beneficiaries and wives under age 65 having such children in their care. For actual data, before 1955, figures are somewhat overstated because of persons receiving both old-age benefits and wife's, widow's, or parent's benefits (about 77,000 individuals as of December 1954) and after 1954 because of persons receiving both old-age benefits and wife's benefits (about 48,000 as of December 1955).

² When disability beneficiaries attain age 65, they are reclassified as old-age beneficiaries.

³ Number of deaths resulting in lump-sum payments during the year.

⁴ Average number of beneficiaries on the roll during the year (except as to lump-sum death payments; see footnote 3).

NOTE.—The estimated figures in this table are based on high-employment assumptions.

In tables 16 to 20, only potential long-range trends have been set down, without recognition of cyclical or periodic fluctuations. Bearing this in mind, certain trends may be observed in these illustrative tables of number of beneficiaries:

(1) An overall uptrend in beneficiaries under all types of benefits payable to aged persons and their dependents;

(2) After 1960, a relatively small increase under the low-cost assumptions and a leveling off under the high-cost assumptions in the number of orphan-child and widowed-mother beneficiaries.

(3) A relatively small, and increasingly smaller, proportion of all benefits represented by younger survivor benefits;

(4) A relatively rapid advance in the proportion of fully insured persons aged 65 and over (including those drawing benefits) as compared with the rise in the proportion fully insured at ages 20-64; and

(5) A rapid rise in the percent of aged persons receiving old-age benefits.

(f) *Remarriage rates.*—Remarriage of "young widows" is an important cost factor since it results in termination of mother's insurance benefits and also of rights to deferred widow's benefits at age 62. The greatest potential duration of benefits occurs among the younger widows, who can receive benefits for many years as mothers of young children and later as aged widows. These, however, are also the women with the greatest chance of remarriage. Among the older

mothers with fewer prospective years of benefit receipt (their youngest child being nearer age 18), the probability of remarriage is smaller. Remarriage rates vary both by age of the widow and by duration of widowhood.

(g) *Disability benefits.*—In making the estimates for monthly disability benefits, which were added by the 1956 amendments, the following assumptions were used:

(1) Low cost: Disability rates for men are about 45 percent of class 3 rates (experience of life insurance companies under disability income policies for the early 1920's, modified for a 6-month waiting period). Incidence rates for women are 50 percent higher. Termination rates for German social insurance experience for 1924-27, which is the best available experience as to relatively low disability termination rates.

(2) High cost: Disability incidence rates for men are 90 percent of the so-called 165 percent modification of class 3 rates (which includes increasingly higher percentages for ages above 45); this modification corresponds roughly to insurance company experience during the early 1930's. Incidence rates for women are 100 percent higher. Termination rates are class 3 rates.

The incidence rates used for both estimates were reduced 10 percent because, unlike the general definition in insurance company policies, disability is not presumed to be total and of expected long-continued duration after 6 months' duration but rather must be so proven then.

It will be noted that the low-cost estimate includes low incidence rates (which taken by themselves produce low costs) and also low termination rates (which taken by themselves produce higher costs, but which are believed to be necessary since, with low incidence rates—meaning only severely disabled beneficiaries—there would tend to be low termination rates, because there would be few recoveries). On the other hand, the high-cost estimate contains high incidence rates, but these are somewhat offset by high termination rates. When disability beneficiaries attain age 65, they are reclassified as old-age beneficiaries.

It is believed that these cost estimates for the monthly disability benefits are as good an indication of such costs as is now possible. Nonetheless, it is recognized that in a new field such as this, more valid estimates are possible only after operating experience has developed from the provisions being in effect for several years. As indicated above, disability incidence and termination rates can vary widely—much more so than mortality rates, which are basic insofar as retirement and survivor benefit costs are concerned.

Benefits as percentages of payroll for selected years are contained in table 12, while table 20 contains the estimated number of beneficiaries in current payment status for selected years.

(h) *Employment of beneficiaries.*—Since monthly benefits for all categories of beneficiaries are, in effect, suspended in any month in which the beneficiary is under age 72 and has more earnings than are permitted without suspension of the benefits under the retirement test, assumptions as to the employment of beneficiaries rank high in importance among the various cost elements. In December 1955, 79 percent of those aged 65 and over who were fully insured were actually receiving benefits. The proportion in the age group 65-71

is influenced to some extent by the favorable work opportunities for the aged now prevailing. In the future, this proportion will probably increase somewhat, if for no other reason than the aging of the insured population.

Then, too, a large demand for labor draws into employment and away from benefit receipt many widowed mothers and older children. There is assumed to be more employment of beneficiaries, and thus savings in cost, in the low-cost assumptions than in the high-cost ones.

(i) *Earnings in covered employment.*—One of the most striking changes in earned income on record has taken place since 1940. Not only have there been further rises in the hourly rate of earnings since the end of World War II, including a sharp rise following the outbreak of the Korean conflict, but also unemployment, including partial unemployment, has been relatively low so that most workers have had a full work-week (table 21).

TABLE 21.—Average earnings credits of workers under old-age and survivors insurance by years, 1937-55

Calendar year	Workers with any earnings in year			Workers with earnings in all 4 calendar quarters		
	Total	Male	Female	Total	Male	Female
\$3,000 maximum earnings base						
1937.....	\$899	\$1,037	\$539	(1)	(1)	(1)
1938.....	832	958	507	\$1,211	\$1,359	\$783
1939.....	881	1,014	536	1,247	1,400	800
1940.....	926	1,070	553	1,305	1,465	831
1941.....	1,014	1,188	574	1,466	1,646	910
1942.....	1,127	1,364	609	1,703	1,939	1,047
1943.....	1,289	1,580	788	1,913	2,205	1,271
1944.....	1,369	1,681	887	1,996	2,301	1,402
1945.....	1,328	1,591	895	1,982	2,293	1,384
1946.....	1,394	1,635	929	2,031	2,269	1,480
1947.....	1,571	1,831	1,044	2,173	2,393	1,611
1948.....	1,677	1,939	1,138	2,281	2,493	1,733
1949.....	1,711	1,964	1,185	2,298	2,508	1,763
1950.....	1,769	2,026	1,232	2,376	2,579	1,852
\$3,600 maximum earnings base						
1951 total.....	\$2,041	\$2,398	\$1,333	(1)	(1)	(1)
1951 wage employment.....	1,997	2,357	1,319	\$2,665	\$2,966	\$1,945
1951 self-employment.....	2,278	2,356	1,745	(1)	(1)	(1)
1952 total ²	2,110	2,470	1,430	(1)	(1)	(1)
1952 wage employment ²	2,070	2,440	1,400	2,740	3,040	2,050
1952 self-employment ²	2,330	2,450	1,740	(1)	(1)	(1)
1953 total ²	2,180	2,550	1,500	(1)	(1)	(1)
1953 wage employment ²	2,150	2,510	1,490	2,820	3,110	2,170
1953 self-employment ²	2,350	2,450	1,800	(1)	(1)	(1)
1954 total ²	2,190	2,530	1,520	(1)	(1)	(1)
1954 wage employment ²	2,150	2,510	1,510	2,820	3,110	2,180
1954 self-employment ²	2,350	2,450	1,750	(1)	(1)	(1)
\$4,200 maximum earnings base						
1955 total ²	\$2,330	\$2,700	\$1,570	(1)	(1)	(1)
1955 wage employment ²	2,290	2,680	1,570	\$3,100	\$3,500	\$2,300
1955 self-employment ²	2,400	2,500	1,600	(1)	(1)	(1)

¹ Data not available.

² Preliminary.

The higher earnings rate gives workers relatively more chance of obtaining credit for quarters of coverage (at \$50 of wages per quarter) now than in the prewar years, thus effecting an increase in number of

persons with insured status and in the average wage used for benefit computations. These increases are assumed to be more or less permanent.

The cost assumptions involve average annual creditable earnings in perpetuity of \$3,555 for men who work in all 4 quarters of a year and, correspondingly, \$2,280 for women. For both men and women the average earnings used for 3-quarter workers is about 45 percent of that for 4-quarter workers (i. e., at a lower rate per quarter). Corresponding proportions for the 2-quarter and 1-quarter workers are about 22 and 9 percent, respectively. As used here, the reference to 4-quarter workers, 3-quarter workers, etc., relates only to the status in a particular year; the estimates allow for the fact that over the course of a working lifetime an individual may be in covered employment all 4 quarters of some years, fewer in other years, and perhaps not in covered employment at all in still other years. These ratios of the part-time average covered earnings to the 4-quarter average parallel very closely the actual ratios observed in the old-age and survivors earnings data.

The 4-quarter earnings assumptions may be compared with the actual experience for such workers in the past years as shown by the last two columns of table 21, but allowance must be made for the changes in the maximum wage base. The taxable (and creditable) earnings assumptions are based on about the level prevailing in 1955 and are about 12 percent above the 1951-52 level, used for the estimates for the 1954 amendments (after adjustment for change in the earnings base).

Development of the prospective cost of the program using the various elements discussed furnishes reasonable illustrations of the number of future beneficiaries and costs. The values derived are well within the outside boundaries of possibility, though by no means either the lowest or the highest conceivable. Experience to date is limited; the payment of monthly benefits began in 1940, and these benefits were revised drastically in 1950 and again moderately in 1952, 1954, and 1956. As payments got underway, limitations of coverage and the insured-status requirement excluded larger numbers of potential beneficiaries. In recent years, as the lag diminished and coverage expanded, payments have been limited by delayed claiming of benefits occasioned by favorable employment conditions during the war and postwar years. The long-range cost estimates look beyond these limitations and attempt to furnish some indication of the future trend in costs of the old-age and survivors insurance program.

It is to be noted that in addition to the assumptions already discussed, the long-range cost illustrations include assumptions relating to retirement rates, interest rate, and various miscellaneous administrative factors. Since the earlier cost estimates were developed, sufficient actual experience under the operation of the program is available to permit the introduction of various modifications to allow for such factors as the minimum and maximum provisions as to benefits, and the provision that the lump-sum death payment in certain instances may not exceed the actual burial expenses. Also taken into account are such miscellaneous factors as differential retirement rates by marital status and the effect of lowered earning capacity during the last illness on the size of survivor benefits.

An important element affecting old-age and survivors insurance costs arose through amendments made to the Railroad Retirement Act in 1951. These provide for a coordination of railroad retirement compensation and old-age and survivors insurance covered earnings in determining benefits for those with less than 10 years of railroad service. All future cases involving less than 10 years of railroad service are to be paid by the old-age and survivors insurance system.

Financial interchange provisions are established so that the old-age and survivors insurance trust fund and the disability insurance trust fund are to be placed in the same financial position as if there never had been a separate railroad retirement program. It is estimated that, over the long range, the net effect of these provisions will be a relatively small gain to the old-age, survivors, and disability insurance system since the reimbursements from the railroad retirement system will be somewhat larger than the net additional benefits paid on the basis of railroad earnings. The long-range costs developed here are for the operation of the trust funds on the basis, provided in current law, that all railroad employment will be (and beginning with 1937 has been) covered employment. The balance in the funds thus corresponds exactly to the actual situation. But the contribution income and benefit disbursement figures shown (as well as the number of beneficiaries) are roughly 5 percent higher than the payments which will actually be made directly to the trust funds from contributors and the payments which will actually be made from the trust funds to the individual beneficiaries. This is the case because the figures here include both the additional contributions which would have been collected if railroad employment had always been covered and the additional benefits that would have been paid under such circumstances. The balance for these two elements is to be accounted for in actual practice by the operation of the financial interchange provisions.

The long-range cost estimates of income and outgo were presented in the body of the report in tables 12, 13, and 14, the first showing the benefit costs relative to payroll and the latter two the progress of the trust funds. In addition to the figures for the low-cost and high-cost estimates, resulting from two carefully considered series of assumptions, intermediate-cost estimates have been developed. The latter are merely an average of the low-cost and high-cost estimates of beneficiaries, disbursements, and income of the trust funds; they are not intended to represent "most probable" figures. Rather, they have been set down as a convenient and readily available single set of figures to be used for comparative purposes.

Since the Congress has adopted the principle of establishing in the law a contribution schedule designed to make the system self-supporting, it was necessary at the time the legislation was enacted to select a single set of estimates as the basis for the contribution schedule. The intermediate-cost estimate was used for this purpose. Quite obviously any specific schedule may require modification in the light of future experience, but the establishment of the schedule in the law does make clear the congressional intent that the system be self-supporting. Exact self-support cannot be obtained from a specific set of integral or rounded fractional rates, but the intention to adhere as closely as possible to this principle of self-support was clearly expressed by the Congress in 1950 when it developed the tax schedule

in the law, and again in 1952, 1954, and 1956 when further amendments were made.

The Congress considered the matter of costs in the legislative development of the 1956 amendments—especially in the light of the revised estimates for the 1954 act which, recognizing the increased earnings level in covered employment, showed somewhat lower costs as a percentage of payroll than previously estimated. These lower costs produced a decrease in the financial deficiency of the 1954 act, which reduced deficiency was approximately preserved in the 1956 act. Under the 1956 act, the disability insurance system showed a small surplus since the increase in the contribution rate which is to support monthly disability benefits is slightly more than sufficient to meet the cost of these benefits under current intermediate estimates. It might be said, in light of the previous paragraph, that for practical purposes the system on the intermediate-cost basis is in actuarial balance (i. e., the difference between the level-premium cost of benefits and the equivalent level contribution rate is negligible).

Tables 12, 13, and 14 show the steady rise in benefit payments under the widely different sets of conditions discussed earlier in this section, and demonstrate the large increases, relatively and in absolute quantities, which would occur even after 1980, particularly under the high-cost assumptions.

Because of the nature of the assumptions, the tables show only smooth trends, omitting the irregularities and periodic cyclical variations which may develop. These irregularities are expected to be far more pronounced in regard to contributions than benefits since, after the system is well established, the dollar amount of the benefit roll will contain a large proportion of fixed payments to permanently retired persons. However, the payroll of covered workers from which the contribution income is derived will react quite sensitively to increases or decreases in job opportunities, changes in the length of the work-week, and changes in unit rates of pay. For demographic reasons alone, as discussed earlier, it is unlikely that the system would level out, even eventually, to a completely fixed relationship between contributions and benefits.

Table 12 compares benefit costs related to payroll for the present estimates. The cost rises steadily under both estimates—leveling out somewhat between 1990 and 2000. The “ultimate” cost for the old-age and survivor benefits is reached some 20 or 25 years after the year 2000 at roughly 8 percent of payroll for the low-cost estimate, 12.5 percent for the high-cost estimate, and 10 percent for the intermediate-cost estimate. The “ultimate” cost for the disability benefits is reached considerably earlier—possibly in 15 or 20 years—at about 0.3 percent of payroll for the low-cost estimate, 0.6 percent for the high-cost estimate and 0.42 percent for the intermediate estimate.

The interest assumption used in determining level-premium costs is 2.6 percent. The average rate on investments of the trust fund is currently about 2.5 percent (as of the end of 1956). The intermediate-cost estimate for the old-age and survivor benefits shows a level-premium cost of 7.43 percent of payroll at 2.6 percent interest. This figure may be contrasted with the level rate equivalent to the total graded contribution schedule in the law assigned to these benefits (taking into account the lower contributions payable by the self-employed as compared with the combined employer-employee rate)

which is 7.23 percent of payroll (see section on actuarial status of the trust funds). Thus, this comparison indicates that according to these intermediate-cost figures, the tax schedule in the law yields revenues not quite sufficient to finance these benefits on a self-supporting basis.

The level-premium cost for the monthly disability benefits is 0.42 percent of payroll on the intermediate basis, or slightly below the equivalent of the contributions for these benefits. Thus, based on this estimate, the tax is somewhat higher than is needed to finance these benefits on a self-supporting basis.

Table 13 shows the progress of the old-age and survivors insurance trust fund under the present estimates. In the low-cost estimate, contribution income exceeds benefit disbursements in all years. Accordingly, the trust fund builds up quite rapidly and even some 45 years hence is growing at the rate of almost \$7 billion per year (and at that time is about \$192 billion). On the other hand, under the corresponding high-cost estimate, benefit disbursements exceed contribution income in and after 1980, and the trust fund, after building up to a maximum of about \$45 billion in 1983, decreases thereafter until it becomes exhausted shortly after the year 2000.

These results for the low-cost and high-cost estimates are to be expected since the old-age and survivors insurance system on an intermediate-cost estimate is approximately self-supporting. Accordingly, a low-cost estimate should show that the system is more than self-supporting and a high-cost estimate should show that a deficiency will arise in later years. At any rate, it appears likely that there will be ample funds for several decades even with relatively unfavorable experience.

According to the intermediate-cost estimate, contribution income will exceed benefit disbursements in almost every year until 1986. After that, the excess of benefit disbursements and administrative expenses over contribution income is, for many years, met by interest earnings of the trust fund. Accordingly, the trust fund grows steadily, reaching a maximum of about \$119 billion in 2014 and then declines slowly. This decrease is another indication that the tax schedule in the law is not quite self-supporting under the intermediate cost estimate.

Table 14 shows the progress of the disability insurance trust fund under the present estimates. In the low-cost estimate, contribution income exceeds benefit disbursements in all years. The fund would be about \$42 billion in the year 2000 and would be growing at the rate of \$1.5 billion a year. In the high-cost estimate, benefit disbursements exceed contribution income in and after 1963, and the trust fund, reaching a maximum of about \$1.3 billion in 1963, would be exhausted in 1975. Under the intermediate-cost estimate contribution income exceeds benefit outgo in all years, and the trust fund in the year 2000 is growing at a rate of about \$600 million a year.

These results for the low-cost and high-cost estimates are to be expected since the disability system on an intermediate estimate basis is self-supporting. Thus, under the assumptions, the low-cost estimate is more than self-supporting and the high-cost estimate shows a deficiency in the next 20 years or so.

A factor mentioned earlier, but not used in the actuarial projections, is the trend observed in the past, of an irregular but upward move-

ment in earnings, both on a dollar basis and in the form of real wages. If this secular trend continues, then—other things being equal and with no changes in the present provisions of the law—the curves of both benefits and contributions would be more steeply ascending than shows. The upward changes in the contribution curves, however, would be far more accentuated than would be such changes in the benefit curves. There are several reasons for this effect, the important one being that the benefit increase would be dampened because—

(1) Benefits are determined by the average monthly wage up to the maximum of \$350; 55 percent is applied to the first \$110 thereof and 20 percent to the part above \$110. As average earnings increase and more persons approach or reach the \$350 maximum, a larger portion of such earnings falls in that bracket of the benefit formula to which the 20-percent rather than the 55-percent rate applies. Thus benefits are smaller in relation to earnings, and consequently in relation to contributions.

(2) Contributions in any year are based substantially on the covered earnings of that year. Benefits in force in any year are based on weighted composite earnings of all previous years in which the insured persons on whose account the benefits are paid worked in covered employment, and in far distant future years would include earnings of as much as 50 previous years.

The assumption of steadily rising earnings in conjunction with an unamended benefit formula would have an important bearing in considering the long-range cost of the program. With such an assumption, the future rise in earnings would seem to offer significant financial help in the financing of benefits because contributions at a fixed percentage rate would increase steadily relative to benefit disbursements. However, benefits paid would steadily diminish in relation to the current earnings level. As a result, offsetting this apparent savings in cost is the likelihood that from the long-range point of view the present benefit formula would not be maintained.

In revising the benefit schedule to conform with the altered earnings level, the changed cost and contribution picture would have to be considered. This is especially true for changes resulting from the fact that benefits would be based on earnings prevailing at the time of the revision and thereafter, while the accumulated trust fund at that time would have developed from contributions on the lower earnings levels of the past. The fund thus would play a less important role in financing the program than it would if the earnings level had not changed. If it is assumed that the benefit level in the future will be adjusted in proportion to the increase in average earnings, the level-premium cost of the program, expressed as a percentage of taxable earnings in perpetuity, would be increased because of the diminishing part played by the accumulated trust fund in financing the program. For small annual rates of increase in average earnings (i. e., for rates less than the assumed valuation interest rate) this increase in cost may be partially counterbalanced by the timelag which would undoubtedly occur between the rise in earnings level and the amendment of the benefit provisions. However, for larger rates of increase in average earnings the level-premium cost in perpetuity would be the ultimate cost, because the fund would ultimately play virtually no role in the financing of the benefits. Nevertheless, during the course

of this century at least, the interest income from the fund would continue to be a significant amount in relation to total disbursements.

In addition to excluding the assumption of increasing wages in the future, the detailed cost estimates given have avoided dealing with various other important secular trends. These have diverse effects on costs which cannot be adequately extrapolated into the future. One illustration is the lengthening of the period of childhood or preparation for work. Another possibility is a drastic change in the average age of retirement, either to a considerably lower effective age so that practically all persons would retire at the minimum eligibility age, or conversely to a higher effective age, under circumstances of greatly improved health conditions combined with good employment opportunities, such that few would retire before age 72 (after which, in any event, benefits are paid regardless of employment).

APPENDIX II. LEGISLATIVE HISTORY AFFECTING THE TRUST FUNDS

Board of Trustees.—From January 1, 1940, when the Federal old-age and survivors insurance trust fund was established, through July 15, 1946, the three members of the Board of Trustees, who serve in an ex officio capacity, were the Secretary of the Treasury, the Secretary of Labor, and the Chairman of the Social Security Board. On July 16, 1946, under the Reorganization Plan No. 2 of 1946, the Federal Security Administrator became ex officio member of the Board of Trustees in place of the Chairman of the Social Security Board, which agency was abolished. On April 11, 1953, the Reorganization Plan No. 1 of 1953, creating the Department of Health, Education, and Welfare, went into effect, and the office of Federal Security Administrator was abolished. The functions of the Administrator as ex officio member of the Board of Trustees were taken over by the Secretary of Health, Education, and Welfare. The remaining membership of the Board has not changed since it was first established. Since the establishment of the fund, the Secretary of the Treasury has been Managing Trustee. The Social Security Act Amendments of 1950 designated the Commissioner for Social Security—since April 11, 1953, the Commissioner of Social Security—as Secretary of the Board of Trustees. Under the Social Security Amendments of 1956, the Board of Trustees of the Federal old-age and survivors insurance trust fund was also made the Board of Trustees of the Federal disability insurance trust fund.

Contribution rates.—The Social Security Act of 1935 fixed the contribution rates for employees and their employers at 1 percent each on taxable wages for the calendar years 1937–39, and provided for higher rates thereafter. However, subsequent acts of Congress extended the 1-percent rates through calendar year 1949. On January 1, 1950, the rates rose to 1½ percent each for employees and employers, as provided by the Social Security Act Amendments of 1947. In accordance with the Social Security Act Amendments of 1950, the 1½ percent rates remained in effect through calendar year 1953 and, on January 1, 1954, rose to 2 percent each for employees and employers. These rates remained in effect through December 31, 1956. Beginning January 1, 1951—the effective date of extension of coverage to self-employed persons—the rates of tax on self-employment income have been equal to 1½ times the corresponding employee rates.